WHAT IS CLAIMED IS:

1.   A method for concatenating packets to be transmitted from a first node to
a second node, the method comprising the steps of:
(a)   receiving packets having at least one traffic characteristic from at least one input port;
(b)   concatenating n received packets to form a concatenated packet; and
(c)   transmitting the concatenated packet from the first node to the second node,
        characterized in that
the n received packets have a common traffic characteristic and n is determined based on
the common traffic characteristic.

2.   The method of claim 1 wherein the concatenated packet is transmitted
through a channel in a communication network, the common traffic characteristic
requires a delay of less than p milliseconds, and the concatenated packet comprises a
common header, a content information part for each of the n received packet and a
payload for each of the n received packet.

3.   The method of claim 2 wherein the channel has a bandwidth of B and n is
determined by solving n from an equation of the form $(H + nI + \sum_{i=1}^{n} P_i)/B < p/1000$,
where H is the size of the common header, I is the size of the content information part of
each of the n received packets, and P_i is the size of the payload of the ith of the n
received packets.

4.   The method of claim 2 wherein the channel has a bandwidth of B and if
P_{max} represents the maximum possible payload size of a received packet having the
common traffic characteristic, n is determined by solving n from an equation of the form
$(H + n(I + P_{max}))/B \leq p/1000$, where H is the size of the common header and I is the
size of the content information part of each of the n received packets.

1   5.   The method of claim 1 wherein the concatenated packet is transmitted

2   through a channel in a communication network, the common traffic characteristic is delay

3   insensitive, and the concatenated packet comprises a common header, a content

4   information part for each of the n received packet and a payload for each of the n received

5   packet.

1   6.   The method of claim 5 wherein the maximum packet size allowed by the

2   communication network is M bytes and n is determined by solving n from an equation of

3   the form $H + nI + \sum_{i=1}^{n} P_i \leq M$, where H is the size of the common header, I is the size of

4   the content information part of each of the n received packets, and P_i is the size of the

5   payload of the ith of the n received packets.

1   7.   The method of claim 5 wherein the maximum packet size allowed by the

2   communication network is M bytes and if P_{max} represents the maximum possible payload

3   size of a received packet having the common traffic characteristic, n is determined by

4   solving n from an equation of the form $H + n(I + P_{max}) \leq M$, where H is the size of the

5   common header, and I is the size of the content information part of each of the n received

6   packets.

1   8.   An apparatus for concatenating packets to be transmitted from a first node

2   to a second node, the apparatus comprising:

3   (a) at least one input port for receiving packets;

4   (b) a traffic characteristic classifier for classifying and storing received packets of

5   different traffic characteristics into different traffic characteristic groups in memory;

6   (c) a concatenated packets preparer for forming a concatenated packet from n received

7   packets; and

8   (d) at least one output port for transmitting the concatenated packet to the second node,

9   characterized in that

10   the n packets belong to one traffic characteristic group and n is determined based on the

11   traffic characteristic of the one traffic characteristic group.

1   9.   The apparatus of claim 8 wherein the concatenated packet is transmitted

2   through a channel in a communication network, the n packets belong to the one traffic

3   characteristic group that requires a delay time of less than p milliseconds, and the

4   concatenated packet comprises a common header of H bytes, a content information part

5   of I bytes for each of the n received packets, and a payload of P_i bytes for ith of the n

6   received packets.

1   10.   The apparatus of claim 9 wherein the channel has a bandwidth of B and n

2   is determined by solving n from an equation of the form $(H + nI + \sum_{i=1}^{n} P_i) / B < p / 1000$.

1   11.   The method of claim 9 wherein the channel has a bandwidth of B and if

2   P_{max} represents the maximum possible payload size of a received packet having the

3   common traffic characteristic, n is determined by solving n from an equation of the form

4    $(H + n(I + P_{max})) / B \leq p / 1000$.

1   12.   The apparatus of claim 8 wherein the concatenated packet is transmitted

2   through a channel in a communication network, the n packets belong to the one traffic

3   characteristic group that is delay insensitive, and the concatenated packet comprises a

4   common header of H bytes, a content information part of I bytes for each of the n

5   received packets, and a payload of P_i bytes for ith of the n received packets.

1   13.   The apparatus of claim 12 wherein the maximum packet size allowed by

2   the communication network is M bytes and n is determined by solving n from an equation

3   of the form $H + nI + \sum_{i=1}^{n} P_i \leq M$.

1   14.   The method of claim 12 wherein the maximum packet size allowed by the

2   communication network is M bytes and if P_{max} represents the maximum possible payload

3   size of a received packet having the common traffic characteristic, n is determined by

4   solving n from an equation of the form $H + n(I + P_{max}) \leq M$.